

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 69539
CR NO. 156
OVER THE
ST. LOUIS RIVER
DISTRICT 1 - ST. LOUIS COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 5221 (CEI 3)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected at Bridge No. 69539, Pier 3, was found to be in good condition with light scaling from the waterline to 3 feet above the waterline. A moderate accumulation of timber debris was observed at the upstream nose of Pier 3 and the channel bottom appeared to be stable with no evidence of significant scour.

INSPECTION FINDINGS:

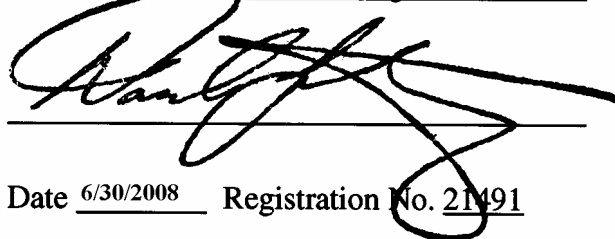
- (A) Light scaling was observed from the waterline to 3 feet above the waterline with typical penetrations of 1/8 inch and a maximum penetration of 1/4 inch.
- (B) A moderate accumulation of 2-foot-diameter-and-smaller timber debris was observed at the upstream nose of Pier 3. In addition, a 1-foot-diameter log was observed along the entire length of the east side of the pier.

RECOMMENDATIONS:

- (A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

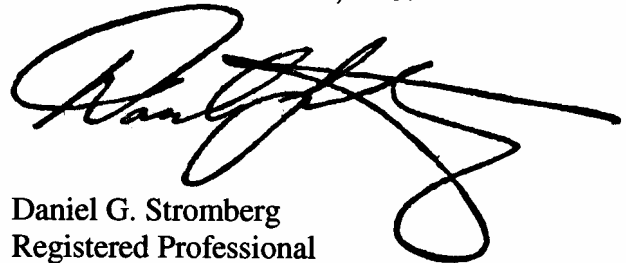
Daniel G. Stromberg



Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 69539

Feature Crossed: St. Louis River

Feature Carried: CR 156

Location: District 1 - St. Louis County

Bridge Description: The superstructure is a four span, multiple prestressed concrete girder bridge supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments, a steel pipe pile pier, and two reinforced concrete piers. The piers are numbered 1 to 3 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg
State of Minnesota, P.E., No. 21491

Dive Team: John Loftus, Valerie Roustan

Date: August 29, 2007

Weather Conditions: Sunny, $\pm 65^{\circ}$ F

Underwater Visibility: ± 2 Feet

Waterway Velocity: ± 1 fps

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 3.

General Shape: The pier consists of an oblong rectangular shaft with rounded noses, which rests upon a rectangular footing founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 7.6 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the upstream end of Pier 3.

Water Surface: The waterline was approximately 28.1 feet below reference.
Assumed Waterline Elevation = 71.9.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code I/02

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

 Yes X No



Photograph 1. View of Structure span over water, Looking South.



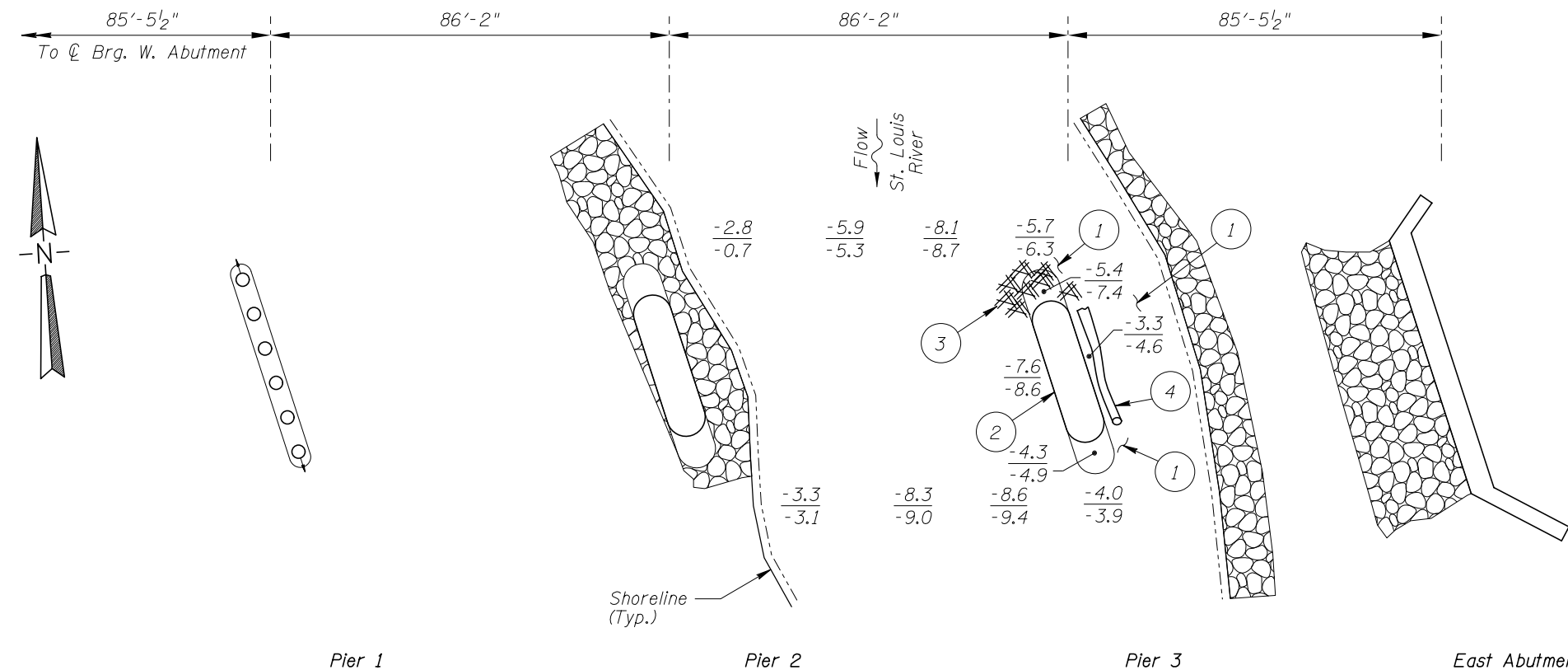
Photograph 2. View of West Embankment looking West.



Photograph 3. View of East Embankment looking East.



Photograph 4. View of Pier 3, Looking East.

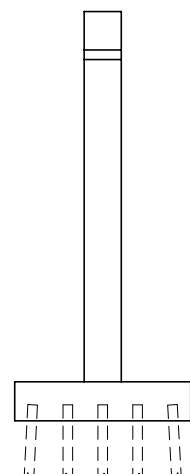


GENERAL NOTES:

- Pier 3 was inspected underwater.
- At the time of inspection on August 29, 2007, the waterline was located approximately 28.1 feet below the top of the cap at the upstream end of Pier 3. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 71.9.
- Soundings indicate the water depth at the time of inspection and are measured in feet.
- Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

- The channel bottom consisted of 1-foot-diameter riprap with no probe rod penetration around Pier 3.
- Light scaling was observed from the waterline to 3 feet above the waterline with typical penetrations of 1/8 inch and up to 1/4 inch maximum penetrations.
- A moderate accumulation of 2-foot-diameter-and-smaller timber debris was observed at the upstream nose of Pier 3 from waterline to channel bottom.
- An 1-foot-diameter log was observed along the east face of Pier 3.



TYPICAL END VIEW OF PIER 3

Legend

- 8.0 Sounding Depth (8/29/07)
- 8.0 Sounding Depth (8/30/02)
- Steel Encased Concrete Pile
- Battered Steel Encased Concrete Pile
- Riprap
- Timber Debris

Note:

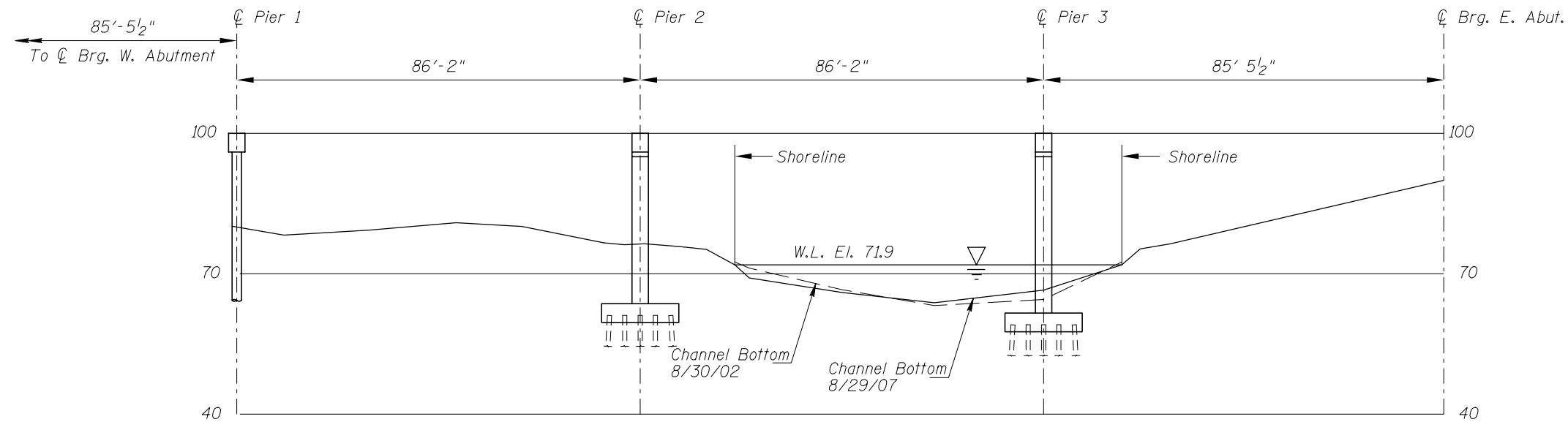
All soundings based on 2007 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION

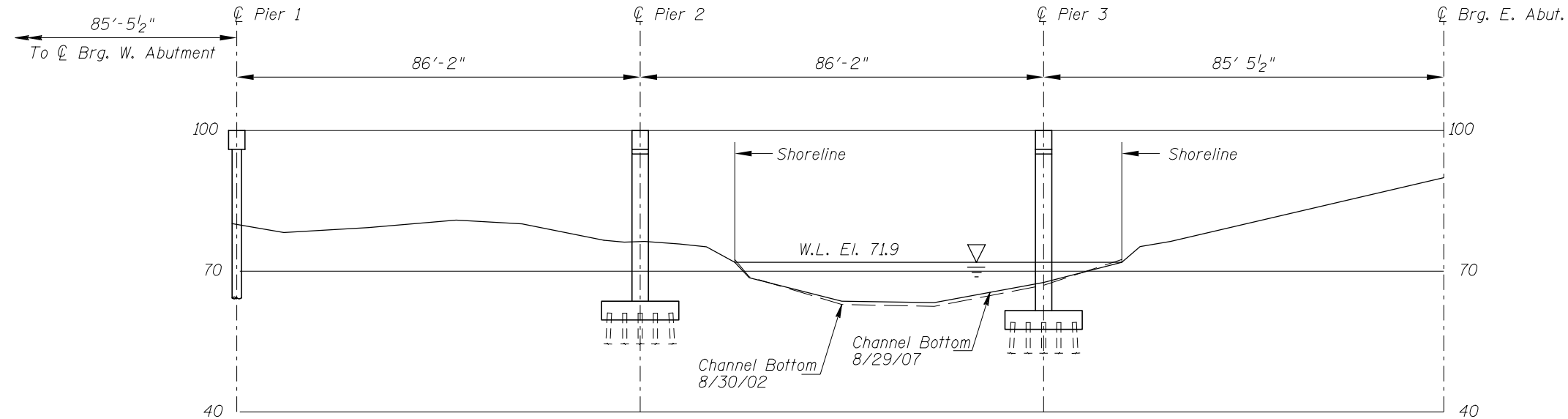
STRUCTURE NO. 69539
OVER THE ST. LOUIS RIVER
DISTRICT 1, ST. LOUIS COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: AUGUST, 2007
Checked By: MDK		Scale: NTS
Code: 52210003		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 69539
OVER THE ST. LOUIS RIVER
DISTRICT I, ST. LOUIS COUNTY
**UPSTREAM AND DOWNSTREAM
FASCIA PROFILES**

Drawn By: PRH	COLLINS ENGINEERS	Date: AUGUST, 2007
Checked By: MDK		Scale: 1"=30'
Code: 52210003		Figure No.: 2

123 North Wacker Drive
Suite 300
Chicago, IL 60606
(312) 704-9300
www.collinsengr.com

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 29, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E. 21491

BRIDGE NO: 69539 WEATHER: Sunny, $\pm 65^{\circ}\text{F}$

WATERWAY CROSSED: St. Louis River

DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR
_____ OTHER _____

PERSONNEL: John Loftus, Valerie Roustan

EQUIPMENT: Scuba, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera

TIME IN WATER: 1:20 P.M.

TIME OUT OF WATER: 1:50 P.M.

WATERWAY DATA: VELOCITY ± 1.0 fps

VISIBILITY ± 2.0 feet

DEPTH 7.6 feet maximum at Pier 3

ELEMENTS INSPECTED: Pier 3

REMARKS: Overall, the concrete was in good and sound condition with light scaling from the waterline to 3 feet above the waterline with typical penetrations of 1/8 inch and a maximum penetration of 1/4 inch. A moderate accumulation of 2-foot-diameter-and-smaller drift was observed at upstream nose of Pier 3. There was also a 1-foot-diameter log along the full length of the shore side of Pier 3.

FURTHER ACTION NEEDED: _____ YES X NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 69539
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED St. Louis River

INSPECTION DATE August 29, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE						CHANNEL					GENERAL					
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 3	7.6'	N	7	N	9	N	7	7	7	7	6	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

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NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.